

# Food Poisoning

التسمم الغذائي



# Definition

Food poisoning (also called foodborne illness) is illness **caused by eating contaminated food.**

Infectious organisms including bacteria, viruses and parasites **or their toxins** are the most common causes of food poisoning.



# Epidemiology

A **food poisoning case** refers to an incident in which **(2) two** or **more** persons experience a similar illness after **ingestion of a common food**, and epidemiological analysis implicates the food as the source of the illness.

# Epidemiology

Age group: can affect any age group

Sex: can affect both sexes

Season: not related to a certain season



In a study in Taiwan, 2021 on foodborne diseases during the period from 2014 to 2018, the results revealed that the **top 2 primary source locations** of the foodborne diseases were **schools and restaurants.**

The top 2 primary food media classifications of the foodborne diseases were **boxed meals and compounded foods** (chocolate (cocoa, cocoa butter, sugar) or pasta (flour, egg, water)).

The top 2 primary incident bacterial classifications of the observed foodborne diseases were *Bacillus cereus* and *Staphylococcus aureus*.

Chia-Peng Yu, Yu-Ching Chou, Ding-Chung Wu, Chun-Gu Cheng, Chun-An Cheng. Surveillance of foodborne diseases in Taiwan. A retrospective study. *Medicine (Baltimore)* 2021 Feb 5; 100(5): e24424. Published online 2021 Feb 5. doi: 10.1097/MD.00000000000024424

# Causes

Most food poisoning can be traced to one of three major causes: bacteria, parasites, or viruses.

These pathogens can be found on almost all of the food humans eat. However, heat from cooking usually kills pathogens on food before it reaches our plate.

**Foods eaten raw are common sources of food poisoning because they do not go through the cooking process. (e.g; shellfish)**

# Causes

Occasionally, food will come in contact with the organisms in fecal matter or vomit. This is most likely to occur **when an ill person prepares food and does not wash their hands before cooking.**

Meat, eggs, and dairy products are frequently contaminated. Water may also be contaminated with organisms that cause illness.

**Food poisoning is caused by micro-organisms capable of secreting enterotoxins**



# Bacteria

**Bacteria are the most common cause of food poisoning.**

Bacterial causes of food poisoning include:

**E. coli**, in particular Shiga toxin-producing E. coli (STEC)

Listeria monocytogenes

**Salmonella**

**Staphylococcus aureus**

Campylobacter

**Clostridium botulinum**

Shigella

Vibrio vulnificus

# Bacteria

**Salmonella is the biggest bacterial cause of food poisoning cases.**

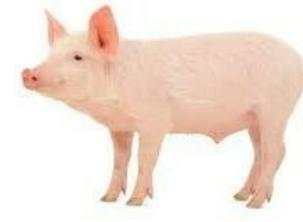
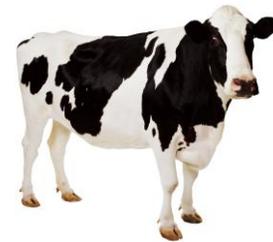
Salmonella food poisoning is caused by other strains than Salmonella typhi strain

The different strains *سلالة* of Salmonella are categorized based on the specific antigen set of each (Antigens are substances that stimulate the body to fight pathogens. These antigen-based subsets are called serotypes)

# **5** most common serotypes in order of prevalence in relation to foodborne illnesses

## **Salmonella Enteritidis**

*Enteritidis is the most common strain of Salmonella in our food supply especially in poultry products.*



## **Salmonella Typhimurium**

*This serotype is also linked to ground beef, pork and other poultry products.*

## Salmonella Newport

*Most often associated with turkey products.*



## Salmonella Javiana

*Watermelon, lettuce, tomato*



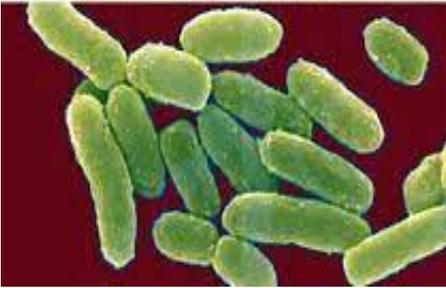
## Salmonella Heidelberg



**Staphylococcus aureus is the second common cause**

Campylobacter and C. botulinum are two lesser-known and **potentially lethal bacteria** that can **lurk** **كامن** in our food.





Hypotonia  
(decreased  
muscle tone)



# Botulism

## التسمم السجقي



# Virus and Parasites

Common viruses that cause food poisoning include norovirus and hepatitis A.

Parasites that cause food poisoning include

Toxoplasma gondii, which causes an illness called toxoplasmosis

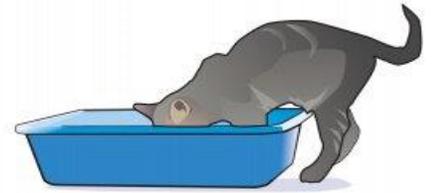
Giardia Cryptosporidium, which causes an illness called cryptosporidiosis or crypto



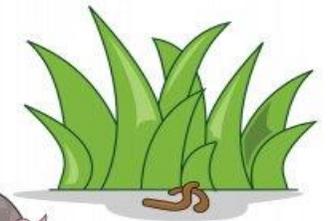
### The Toxoplasma Lifecycle



① Cats ingest the *Toxoplasma* organism through the meat of an infected rodent.



③ Reingestion of the eggs by rodents or cats causes reinfection. Other species may be also be infected but only if large numbers are ingested.



② *Toxoplasma* eggs are deposited in the cat's feces.

# Toxoplasmosis

داء القطط



# Norovirus (Stomach Flu)

Viral gastroenteritis is an intestinal infection that includes signs and symptoms such as watery diarrhea, stomach cramps, nausea or vomiting, and sometimes fever.

The most common way to develop viral gastroenteritis (stomach flu) is through contact with an infected person or by **consuming contaminated food or water.**

# How you get food poisoning

Food poisoning is caused by eating something that has been **contaminated with microorganism**

This can happen if food:

- is **not cooked** or **reheated** thoroughly

- is **not stored correctly** – for example, it's not been frozen or chilled

- is **left out for too long**

- is handled by someone who's ill or has not washed their hands

- is eaten after its "use by" date

**Any type of food can cause food poisoning**



# SIGNS & SYMPTOMS



# SIGNS & SYMPTOMS

Common cases of food poisoning will typically include a **few of the following symptoms:**

- Abdominal cramps
- Diarrhea
- Nausea
- Vomiting
- Loss of appetite
- Mild fever
- Weakness
- Headache

# **Symptoms of potentially life threatening food poisoning include:**

- Diarrhea that lasts for more than 3 days
- A fever higher than (39.0°C)
- Difficulty seeing or speaking
- Symptoms of severe dehydration, which may include dry mouth, passing little to no urine
- Bloody urine

**Severe Dehydration**

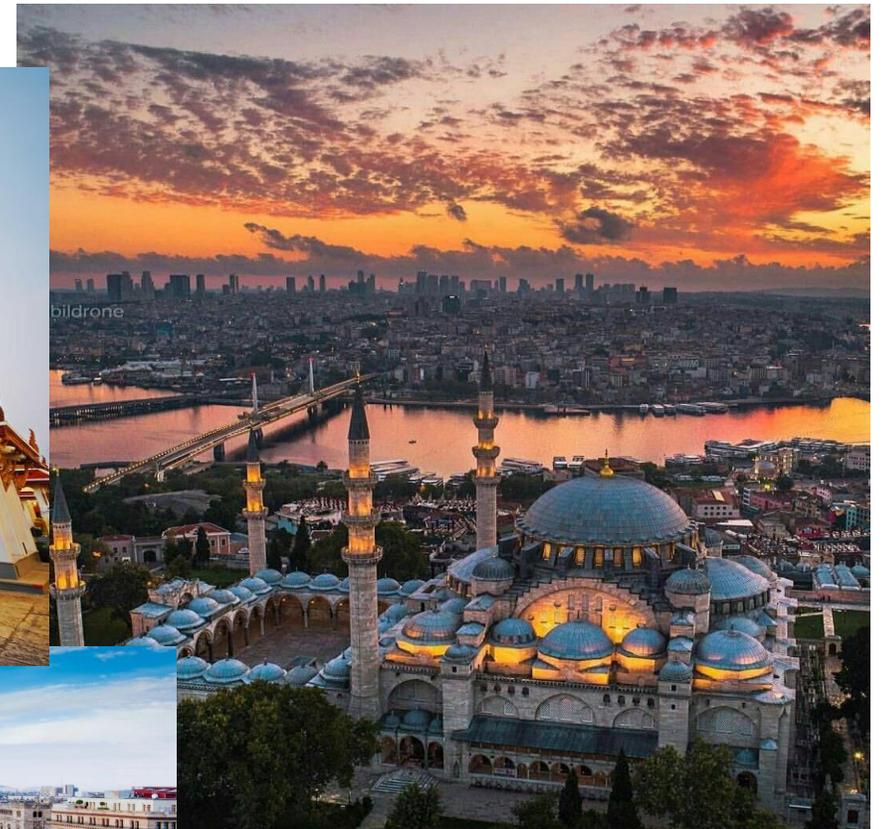


# Travelers' diarrhea

Traveler's diarrhea occurs within 10 days of travel to an area with poor public hygiene.

The most common illness in travelers. Affects **20%** of those who travel to high risk destinations of the world.

Common among people traveling to Asia (except for Japan and Singapore), the Middle East, Africa, Mexico, and Central and South America.



Prof. Ashraf Zaghloul

# Travelers' diarrhea

Caused by drinking water or eating foods contaminated with bacteria, viruses, or parasites.

It usually resolves without treatment in a few days.

# Prevention of food poisoning

## 1- Clean (food handling)

Wash your hands and work surfaces before, during, and after preparing food. Make sure to offer high risk groups clean food (**infants, adults aged 65 and older**)

In a study in South Africa revealed that (68%) of food handlers in 15 hospices had not taken basic food safety training.

The knowledge, attitude, and practices of food handlers in central South African hospices. Jane Sebolelo Nkhebenyane, Ryk Lues. Food Sci Nutr. 2020 Jun; 8(6): 2598–2607. Published online 2020 May 12. doi: 10.1002/fsn3.1499

# Prevention of food poisoning

## 2- Separate

Separate raw meat, poultry, seafood, and eggs from ready-to-eat foods.

## 3- Cook

Cook food to the right internal temperature to kill harmful bacteria.

## 4- Chill

Keep your refrigerator 4°C (40°F) or below.